

# WSDOT RESEARCH PROPOSAL PREPARATION GUIDE

## **For Questions:**

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*Note to Reader: Many of our projects are undertaken by faculty members from one of the state supported universities in Washington. These guidelines may contain elements which are unique to those universities. References to TRAC refer to the "Transportation Research Center" with offices at the University of Washington and Washington State University.*

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## **Table of Contents**

[Purpose](#)

[General](#)

[Submittal of Proposals](#)

[Organization of Proposal](#)

- [Title Page](#)
- [Background](#)
- [Objectives Section](#)
- [Benefits to WSDOT & Public](#)
- [Product to be delivered](#)
- [Anticipated Implementation of Research](#)
- [Work Plan](#)
- [Staffing Plan](#)
- [Level of Effort](#)
- [Facilities Available](#)
- [Data Supporting Competency](#)
- [Time Schedule/Milestone Chart](#)
- [Technical References](#)
- [Budget Estimate](#)
- [Budget Plan](#)

## PURPOSE

This guide is intended to help researchers prepare a proposal that will meet our information needs for a research proposal. **Proposals prepared as requested will avoid delays.**

[Return to Table of Contents](#)

## GENERAL

The research proposal is a document that clearly defines the research objective, provides a detailed work plan for achieving the objective, and indicates how the research findings are expected to be used. The proposal should also serve the following purposes:

- Provide sufficient information for research managers to evaluate the need and justification for the research and to assess the probable value of the proposed work plan to the department;
- Clarify the study's overall objectives as well as a plan for meeting those objectives;
- Allocate staffing and funds for research;
- Provide a measurement of the potential uses and benefits of the research;
- Identify potential areas in which to apply the products of the research; and
- Provide a basis for measuring progress and results of the research project.

[Return to Table of Contents](#)

## PROPOSAL SUBMITTAL

**Submit** six copies of your proposal to:

Martin D. Pietz, Director of Transportation Research  
Planning and Programming Service Center  
Washington State Department of Transportation

PO Box 47370

Olympia, WA 98504-7370

[Return to Table of Contents](#)

## ORGANIZATION

Proposals should be arranged as follows:

- a. Signature Page \*
- b. Title Page
- c. Table of Contents
- d. Problem Statement
- e. Background
- f. Objectives
- g. Benefits
- h. Products
- i. Implementation
- j. Work Plan
- k. Staffing Plan
- l. Level of Effort
- m. Facilities Available
- n. Supporting Data
- o. Work Time Schedule
- p. References
- q. Budget Estimate
- r. Budget Plan

The remaining sections of this document, following the table of contents, provide a shell to help structure your proposal. Read the explanations of what each section should contain, then replace the descriptions with information that is appropriate for your project.

\* If applicable.

[Return to Table of Contents](#)

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**TITLE PAGE**

**PROPOSAL TITLE**

**Author and Organization**

**Date**

**Status of Document: Final or Draft**

## TABLE OF CONTENTS

<b><u>Section</u></b>	<b><u>Page</u></b>
• Problem Statement	
• Background	
• Objectives	
• Benefits	
• Products	
• Implementation	
• Work Plan	
○ Task 1 -	
○ Task 2 -	
○ Task 3 -	
○ Task 4 -	
○ Task 5 -	
○ Task 6 -	
• Staffing Plan	
• Level of Effort	
• Facilities Available	
• Supporting Data Work	
• Time Schedule	
• References	
• Budget Estimate	
• Budget Plan	

## **PROPOSAL TITLE**

### **PROBLEM STATEMENT**

This section should be a clear and concise statement covering the problem to be solved by the proposed research.

### **BACKGROUND**

This section should contain the following essentials:

- The findings of a literature search and an indication of the existing technology;
- An indication of the researcher's understanding of the underlying principles involved;
- The relationship between the proposed study and prior research; and
- A statement supporting the researcher's proposed approach and the reasons why.

[Return to Table of Contents](#)

### **OBJECTIVES**

This section should state the technical objectives upon which the researcher's efforts will be focused. The objectives should clearly and concisely identify what products the researcher seeks from the research.

[Return to Table of Contents](#)

### **BENEFITS**

This section should clearly and concisely describe what benefits the researcher anticipates from the research. Examples include:

- A saving of time and money;
- An increase in safety;
- An improvement in service;
- An improvement in aesthetics or environmental quality;
- A reduction in product or operational costs; and
- An improved procedure or longer lasting product.

[Return to Table of Contents](#)

### **PRODUCTS**

Provide a list of products that will be delivered to WSDOT during the contract. This might include draft reports, final reports, computer programs, photos, slides, slide/tapes, video tapes, equipment, visual aids, physical models, databases, etc. At a

minimum, the following documents will describe the research and its results (content and format requirements are detailed in *WSDOT Research Report Requirements*):

- draft technical report and/or draft final report;
- camera ready final technical report and/or final report;
- a one page summary; and
- quarterly progress reports.

[Return to Table of Contents](#)

## **IMPLEMENTATION**

This section should assess areas in which the anticipated research findings could potentially be applied, including the following:

- The means by which the research findings might best be utilized by WSDOT, such as the circulation of a written report, a report summary, personal contact between WSDOT research and operating engineers, or workshop or seminar;
- What was the major discovery or finding resulting from this research WSDOT will make use of;
- How will WSDOT make use of it and what is the value added from the research;
- What specific standard of practice would be changed by the findings (if successful) such as AASHTO standard specifications, WSDOT standard specifications, policy directives, implementation manuals, or operating procedures;
- Additional steps the researcher expects will be required before the research findings can be applied if they will not be suitable for immediate practical use at the end of the stated project.

[Return to Table of Contents](#)

## **WORK PLAN**

This section should ***completely describe*** the plan or approach the researcher intends to use and specify how the researcher will structure and perform the research to meet each research objective. The format of this section shall be divided into major tasks. The researcher shall address how each task will be carried out. Give each task a number and a title, followed by a brief description of what each task will entail. The work plan should contain the following information for each of the four types of research activities as appropriate:

### **Theoretical Research (concept oriented)**

- The basic approach to the development of the theory

- Specific hypotheses derived from the theory
- A theoretical framework (experimental design) for research
- Significant variables to be tested
- Data analysis and statistical procedure(s)

### **Applied Research (problem oriented)**

- Principles or theories to be used in the solution
- Possible problem solutions
- Critical experiments to test the applicability of the theory
- The kind and range of variables to be tested
- Experimental facilities available
- Data analysis and statistical procedure(s)

### **Development**

- The device, process, material, or system to be developed
- The applied research upon which the development is to be based
- The plan of work to complete the development
- The kind and range of variables considered in the development
- Facilities available for the development
- Data analysis procedures, including adequate statistical methods

### **Measurement, Test, and Evaluation**

- Item to be evaluated or measured
- The extent of the development of the item
- Criteria for evaluation
- Testing procedures
- The conditions under which evaluation will be made
- Controls to be used
- Data analysis procedures, including adequate statistical methods

### **Task 1 "Task 1 Title"**

Description of Task 1.

### **Task 2 "Task 2 Title"**

Description of Task 2.

[Return to Table of Contents](#)

## **STAFFING PLAN**

This section should discuss

- the people involved in the research and their capabilities;
- staff organization and functions;
- personnel availability; and
- the augmentation necessary to properly conduct the research.

It should relate personnel to specific aims and procedures. An organization chart of the project and a short description of researchers and their roles is appropriate.

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The following paragraph must be included in all UW TRAC proposals:

*Editing, word processing, and graphics support for this project's reports and presentations will be provided by the TRAC interdisciplinary center at the University of Washington. TRAC staff will also play a minor administrative role in ensuring budget accountability and in maintaining auditable records of project related correspondence, progress reports, travel requests and records, and report submittals. These services are budgeted under the line item Other Contractual Services on the budget page.*

[Return to Table of Contents](#)

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## **LEVEL OF EFFORT**

This section identifies the percentage of effort by each person on the project, as it relates to the work plan. The table should reflect staff *time* and not percentages. A table showing the allocation of staff time by task is required. Use one of the examples below to show allocation of staff time by task:

	Task (hours, weeks, months, etc.)			
Personnel	1	2	3	Total
Principal Investigator				
Graduate Assistant				
Total				

[Return to Table of Contents](#)

## **FACILITIES AVAILABLE**

This section should describe the facilities at the disposal of the researcher that are important to the conduct of the work.

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The following paragraphs describe the facilities available to TRAC at the University of Washington:

This research effort will be conducted through the Washington State Transportation Center, located in the College of Engineering at the University of Washington. TRAC resources available for this project include a professional staff to aid in the writing, editing, and graphics involved in report production; microcomputer facilities; and conference and drafting facilities.

The University libraries, with more than 5 million volumes, provide an outstanding collection of books, periodicals, research reports, publications, and other materials. In addition, the facilities of the Washington State Department of Transportation's library in Olympia will be available for the project.

The UW Academic Computer Center provides extensive information processing facilities to the campus for research use. An IBM mainframe computer is supplemented with a campus computer network and support for all major programming languages; numerous software packages for statistical analysis, database management, graphics and document preparation; and a range of peripheral equipment, including graphics terminals and plotters. The UW Department of Civil Engineering also maintains its own computer-aided design laboratory, with a number of graphics terminals and associated peripherals hardwired to the campus computing network.

[Return to Table of Contents](#)

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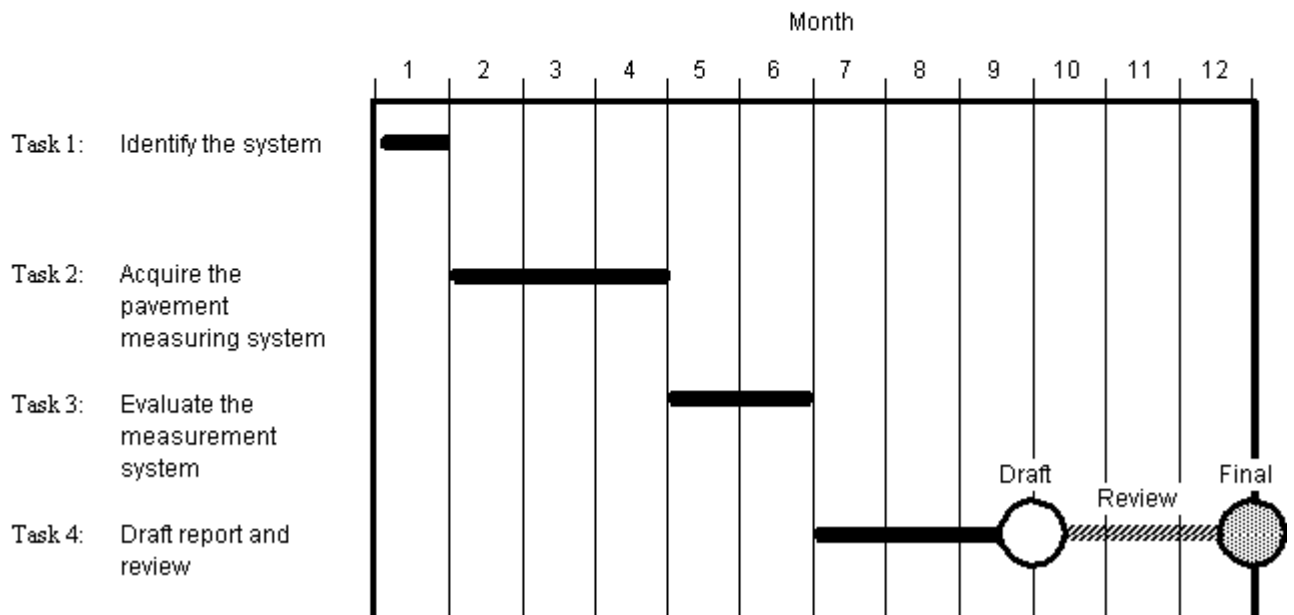
## **SUPPORTING DATA**

This section should summarize the principal researcher's experience, capability, and past performance on **related research work** in a paragraph or two. Where an agency has prime responsibility for conducting research, such information should be related to the agency as well as to the individual. **One copy of the researcher's academic résumé on file at the WSDOT Research Office will be accepted as supporting data.** Please do not attach academic résumés to proposals.

[Return to Table of Contents](#)

## **WORK TIME SCHEDULE**

Bar charts, critical path method diagrams, flow charts, or other types of pictorial presentation should be provided to illustrate the interrelationship and scheduling of the major operational tasks of the research. The overall schedule should allow for the review process, as shown in the following figure:



[Return to Table of Contents](#)

## **REFERENCES**

References should follow the form of author, title, and facts of publication (see the University of Chicago Press *A Manual of Style*).

Two reference formats contained in this file allow you to format numbered or alphabetic references.

[Return to Table of Contents](#)

## **BUDGET ESTIMATE**

See example.

*(For UW/WSU proposals, please ask TRAC support staff to help assemble your project's budget. A customized computer program that TRAC has developed efficiently constructs the budget.)*

The budget should show the estimated cost for the full term of the research project, the current fiscal year and each subsequent year, and should include the following:

- Salaries for professional and support personnel
- Subcontracts
- Personal services
- Overhead and indirect costs
- Benefits
- Travel
- Computer time
- Inventory of equipment (purchase and/or rental)
- Expendable materials and supplies
- Report printing
- Special services (where applicable)
- A supplementary tabulation showing the total cost by sources of funds where financing includes more than federal and state matching funds.

(Remember to figure each fiscal year separately, e.g., FY 2001, FY 2002, Total. - Note that Washington state fiscal years run from July 1 through June 30)

[Return to Table of Contents](#)

## **BUDGET PLAN**

See example.

The budget plan aids the Research Office in monitoring project expenditures.

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*(For UW proposals, TRAC will prepare the budget plan.)*

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[Go To Top](#)